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PROVINCE OF BRITISH COLUMBIA.

DEPARTMENT OF AGRICULTURE.

(WOMEN'S INSTITUTES).

BULLETIN No. 36.

THE PREPARATION OF FOOD.

—BY—

MISS ALICE RAVENHILL,
Fellow of the Royal Sanitary Institute, etc., etc.



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THE PROVINCE OF BRITISH COLUMBIA.

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Department of Agriculture,

Victoria, B.C., November 7th, 1911.

The Honourable Price Ellison,

Minister of Agriculture.

Sir,—I have the honour to submit herewith Bulletin No. 36, entitled "The Preparation of Food," compiled under the auspices of the Women's Institutes.

I have the honour to be,

Sir,

Your obedient servant,

WM. E. SCOTT,

Deputy Minister of Agriculture,

Superintendent of Institutes.

THE PREPARATION OF FOOD.

"Preserve and treat food as you would your body," said Dr. Benjamin Ward Richardson, "remembering that in time food will be your body."

These words contain a truth too often overlooked. The daily routine of meal-times is so familiar that we rarely give a thought to any result of eating, except the mere satisfaction of hunger. The work of preparing and preserving food is so continuous that carelessness in its handling, monotony in its service, and slight neglect in its keeping creep in as a result of haste, fatigue, or indifference.

REASONS FOR A STUDY OF THE SUBJECT.

There are, however, forcible reasons why women should be as well informed on the right care of human food as has latterly been customary among men in connection with the right feeding of poultry and stock. All intelligent folk hold the faith that health of mind and body is desirable above all else. Now, experts assure us they are in possession of abundant evidence to prove that food has more to do with a good state of health than any other one thing; consequently, information on the subject of daily diet is now sought, and the value of reliable teaching is understood.

In the first place, it is wise to inquire—

WHAT IS FOOD?

Food may be described as anything which, when taken into the body, can be utilized—

(1.) To supply the warmth upon which life depends:

(2.) To repair the daily wear and tear of the body, and, in childhood, to provide for growth:

(3.) To manufacture the energy which is used in breathing, digesting, thinking, working, playing, or in any other bodily function or activity.

Another bulletin will explain which foods are most valuable for each of these purposes, and why some foods suit one age or one season of the year better than do others. In these pages we can only consider the point referred to in the title—viz., the preparation of food in the home.

THE PREPARATION OF FOOD FOR HUMAN CONSUMPTION.

In reply to the question how men prepare their food, nine people out of ten would promptly reply, by cooking; and true enough the answer would be. Mankind *is* the only cooking animal in the world.

But, as a matter of fact, there are various other methods of food-preparation besides the application of heat, which is what most people understand to be a cook's work.

Animal food, for instance, must be prepared for killing; killed; dressed; chilled, if it has to be transported some distance, or otherwise preserved, and packed; displayed for sale in shop or market; conveyed to the purchaser's home; possibly salted, smoked, or pickled; certainly washed, before the time comes to cook it as food.

Vegetable foods, also, must be gathered or dug, perhaps packed, displayed for sale, and transported to their destination before they are handled in the kitchen.

Meanwhile, foodstuffs pass through many hands, not always of the cleanest; they may be exposed to burning heat, certainly to dust and dirt (the ingredients of which include the droppings of animals, men's spit, hairs, shreds of skin, pus from uncovered wounds, and other unsavoury substances). Furthermore, they are bruised by rough handling and bad packing; so that moulds and the germs which cause food to taint and decay can gain an entrance to the flesh of fish or meat, or to the pulp of fruit and vegetables; consequently, cleansing is a first and most important part of the cooking process.

WORK FOR THE WOMEN'S INSTITUTES.

More harm is wrought in this world by want of thought than from any other one cause. In the interests of health, such want of thought in connection with a nation's food must be firmly and intelligently checked. It is just the piece of work which could and should be undertaken locally by Women's Institutes. Through the co-operation of their members, the standard of cleanliness in markets and shops can be raised and the careful handling of foods be enforced.

WHERE SUCH WORK HAS BEEN ACCOMPLISHED.

It is a great credit to the women of Indianapolis and of Portland, U.S.A., that, since learning these things, they have worked with so much perseverance and tact that the markets of their cities and the handling of their foodstuffs are now reported to be object-lessons to other places.

THE PREPARATION OF FOOD IN THE KITCHEN.

Even when food has reached the kitchen it undergoes many forms of preparation other than roasting, boiling, baking, or stewing. Meat, for instance, is minced, bread is "crumbed," eggs are beaten, cheese is grated, cream is whisked. Why? The answer to this question will be found among the following reasons why food is cooked.

FOOD IS COOKED:

(1.) To make it more palatable and attractive:
(2.) To increase its digestibility:
(3.) To afford wholesome variety and to increase nutritive value:
(4.) To economize heat and energy to the body:
(5.) To postpone decay and to destroy parasites:
(6.) To promote cleanliness:
(7.) To economize expense:

Reason (1).—To make Food More Palatable and Attractive.

This reason is too obvious to call for much illustration. We have only to compare the taste of raw meat with that of a well-roasted joint, or of uncooked with well-fried fish.

Consider, also, the improvement in the appearance of cold meat or of butter when garnished with parsley or fern; or the pleasant variety imparted to the

familiar cornstarch mould if turned out in a fresh shape or coloured with a few drops of cochineal or spinach green. The food is rendered more attractive, more palatable, and, last but not least, more digestible. "To make the mouth water" should constitute a cook's ambition, for it is a preliminary to good digestion. Monotony in daily diet is a widespread source of dyspepsia.

Reason (2).—Food is cooked to increase its Digestibility.

It is possibly a matter for surprise that this reason does not appear first on the list, for the changes brought about in well-cooked porridge or in a "floury" potato are, as we all know, necessary to their digestion. But, as a matter of fact, while exposure to heat is essential for all starchy foods, such as rice, flour, etc., flesh foods and fats are thereby liable to become, to a greater or less degree, indigestible, unless care be exercised and certain precautions be observed.

Nearly all the varied kinds of manipulation employed in the preparation of food materials have as their object to increase their digestibility. The majority may, indeed, be looked upon as a first stage of mastication or chewing.

For example: Meat is pounded or minced. Bread, cheese, suet, or nuts are grated, chopped, or ground, because, by dividing these substances into tiny fragments, the digestive juices come more completely in contact with every particle. Eggs are beaten or whisked; the result of which is to entangle air in the glutinous substance. These bubbles of air expand when heated, so that the jelly-like mass becomes "light." If a cake or pudding is chilled by the premature opening of the oven-door before a crust has formed, the heated air contracts and the mixture is "heavy." Butter or lard is "rubbed" into flour; a process called "shortening," of which the object is to divide the lump of fat into very small particles, as well as to separate the grains of flour. Pastry is "rolled" to make it dry and flaky, and it is pinched together gently at the edges when "folded" in order that cold air may be imprisoned between the folds. This air also expands in the process of baking and makes the pastry "light." Sometimes cheese and bread are grated and mixed before cooking, by which means the concentrated cheese particles are separated and made easy of digestion; whereas uncooked or toasted cheese is often a source of dyspepsia.

Another important form of manipulation is the removal of the bruised or diseased parts of fruits and vegetables, as well as their skins, cores, and stalks. The rinds and cores of fruit and the stalks of vegetables may fairly be compared to thin layers of cork, and are just about as digestible. All bruised or diseased parts of any form of food are the seat of decay and unfit for human food.

Reason (3).—The Cooking of Food includes the Combination of Different Substances.

(*a*.) To afford variety:

(*b*.) To increase the amount of nourishment.

Illustrations of (*a*).—The addition of lemon-peel or a few drops of vanilla to a cornstarch mould, or the flavouring of a meat-stew now with onion, parsnips, and carrots, now with celery. The combination of suet-pudding mixture with sultanas, or jam, or molasses, or syrup, or stewed fruit, or meat.

Illustrations of (*b*).—The combination of eggs with milk in custard, or of butter with bread in a pudding, or of oil with lettuce in a salad.

Reason (4).—Food is cooked to economize Heat and Energy to the Body.

The temperature of the human body in health is 98.5° Fahr. This temperature is maintained by the food eaten and the clothing worn. Now, all food must be raised to the temperature of the body before the process of digestion can begin. If cold food be eaten, the warmth necessary to raise it to 100° Fahr. must be furnished by the body itself. If hot food be eaten, that amount of heat is saved. Consequently, in cold weather, great bodily comfort and a decided gain of energy results from a hot meal. Indeed, the virtue as a body-warmer, ascribed to a glass of steaming, hot grog, exists chiefly in the rapidity with which the hot water is absorbed into the blood and carried all over the body. Alcohol, by the way, is a body-cooler; the reason for this will be explained in another bulletin.

There is reason in eating cold meals in very warm weather, for in the process of their digestion the considerable amount of bodily heat utilized constitutes a relief and not a tax to the system.

As previously stated, the process of applying heat renders some kinds of food more digestible. Energy otherwise used in dissolving it is thus saved for other purposes. All kinds of fruit and vegetables are rendered more easy of digestion by cooking. Compare a raw with a baked apple, or a cooked with an uncooked carrot. Well-cooked food also, such as a savoury roast or well-fried fish, stimulates the flow of the digestive juices; the food is better digested and the body is better nourished.

Reason (5).—Food is cooked to postpone Putrefaction and to destroy Parasites.

Every housewife knows the importance of cooking meat or milk with as little delay as possible, especially in hot or damp weather. In one way the explanation is quite simple. All decay is the result of germ-activity, whether it take the form of the souring of milk, the tainting of meat, or the spoiling of fruit. These low forms of vegetable life thrive only when they have warmth, moisture, and suited food.

Meat, fish, fruit, poultry, or game provide their favourite foods; consequently, given a hot day, they start work, for sufficient moisture is present in these substances to meet their need. If the air be damp, so much the better for their mischievous activities. Most of these micro-organisms, as they are called, thrive best at a temperature between 70° and 100° Fahr. They are killed by very high temperatures, such as that of boiling water. So we boil milk to preserve it, and so we cook meat also. But, unfortunately, so far as is at present known, it is only the surface of joints which is protected by cooking. The interior of a 5- or 6-lb. roast, for instance, never reaches the temperature necessary to the destruction of these germs of decay, if they are present.

This fact explains why, in hot, damp weather, joints "turn off" quickly, even when cooked. On the other hand, no animal parasite found in meat can withstand a temperature of 160° Fahr.; consequently, all meat—and pork in particular—should be "well done."

Salt, sugar, spices, and herbs are all used to postpone decay in foodstuffs, because they withdraw water and render the substance too dry for germ life, or they make the flavour unpalatable to these food-spoilers.

Reason (6).—Food is cooked to insure Cleanliness.

In the first place, dirt is removed by washing, wiping, "flouring," and other familiar methods; though, be it remembered, boiling water alone suffices to sterilize. Surface, visible dirt may be and is removed by cloths moistened in lukewarm water; but the use of a powerful microscope would reveal an amount of unsuspected dirt, disconcerting, though possibly convincing, to those who despise what they call "fads," and ridicule the proposal to insist upon greater precautions in the transport and preparation of food.

Numerous and recurring outbreaks of typhoid fever have been traced in recent years to this source. The infective matter of typhoid fever is quite invisible to the naked eye, but it is constantly conveyed to food on the unwashed fingers of recent sufferers, who omit thoroughly to scrub their hands after attention to their bodily functions. Such food, unless boiled, can and does carry infection to its consumers.

Two other unconsidered sources of uncleanliness exist in some kitchens:—

(1.) The use of any kind of paper which happens to be at hand, printed or otherwise, for lining or oiling cake-tins, covering puddings lest they burn in the oven, draining fried fish, and so forth. The use of clean, fresh, unprinted paper alone should be allowed. Large sheets should be cut to a convenient size and stored for use in a card-portfolio placed in a convenient and prominent place in the kitchen.

(2.) The use of dirty dish-cloths. These should be scalded daily (twice a day, if necessary) in boiling water, before being hung out to sweeten in a good current of air. A strict habit should also be formed of reserving certain cloths for certain purposes. A matter of some difficulty this where several people take part in kitchen-work, but a difficulty which can be overcome by that attention to detail which constitutes good housekeeping.

Reason (7).—Good Cooking also economizes Expense, because:

(*a.*) It preserves food which would otherwise decay:

(*b.*) It enables cheaper cuts of meat or fish to be used, of which the nutritive properties are equal to the most expensive, only they require more care in cooking, and take somewhat longer to prepare:

(*c.*) It preserves instead of wasting the nutriment present in meat, fish, or vegetables. The object of broiling a steak, for instance, or of plunging scraped carrots into boiling water is to harden or seal over the surface, so to speak, so that the juices of the meat or the sugar in the carrot shall be retained; otherwise they would escape into the water and be lost:

(*d.*) It allows "leavings" and odds and ends to be used up in the manufacture of savoury stews or soups, or of appetizing puddings. Skilled cooks utilize every drop of gravy or sauce, every fragment of vegetable or pie, every crumb of cake, for some "made" dish. It is the unskilled cook who is extravagant and careless. A whole bulletin could be prepared on the neglect of kitchen economy in this respect.

PRINCIPAL METHODS OF APPLYING HEAT TO FOOD WHEN COOKING.

(1.) Direct application of heat:
  (*a.*) Broiling—Cooking over a glowing fire:
  (*b.*) Roasting—Cooking before a glowing fire.

(2.) Application by means of heated air:
  (*a.*) Baking—Cooking in an oven.

(3.) Heat applied by means of water:
  (*a.*) Boiling—Cooking in water at 212° Fahr.:
  (*b.*) Stewing—Cooking for a considerable time in water below 212° Fahr.

(4.) By contact with steam or by the heat of steam surrounding the vessel:
  (*a.*) Moist—Cooking in a steamer:
  (*b.*) Dry—Cooking in a double boiler.

(5.) Heat applied by means of heated fat:
  (*a.*) Frying—Cooking in hot fat deep enough to cover the article cooked.

(6.) Heat applied by means of heated metal:
  (*a.*) Cooking in a frying-pan or on a griddle, with little or no fat.

METHODS OF COOKING FOOD BY HEAT AND MOISTURE.

We cook food by exposing it to heat only, as when we roast, broil, grill, or bake; or to heat combined with moisture, as when food is broiled or steamed; or to direct contact with a heated medium, as when food is fried in fat.

WHY WE COOK BY BOILING.

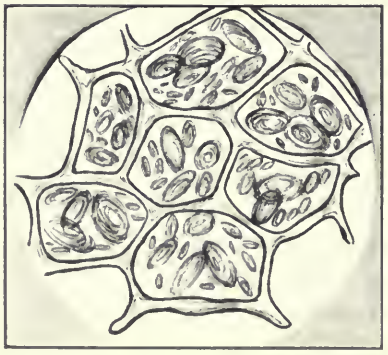
To say we boil food is not accurate. It is not the food which is boiled, but the water in which it is cooked. Boiled food is spoiled food, as many a housewife knows to her cost.

A cook has three distinct objects in view when she employs this method of preparing food:—

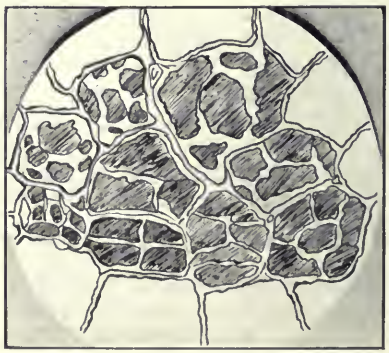
(1.) If she desires to *retain all* the nutriment and flavour of a fowl or fish, she plunges them into boiling water for a few minutes, to harden the surface, and thus to prevent the escape of nutriment.

(2.) If she wants to *extract* the juices or salts *from* raw food, she places meat or bones in cold water, which she allows to come slowly to boiling-point. She keeps the water at this temperature until all the goodness has passed from food to water.

(3.) If she wishes to make a thick syrup or sauce, she keeps the liquid at boiling-point until much of the water has passed off as steam, when the fluid becomes thick.

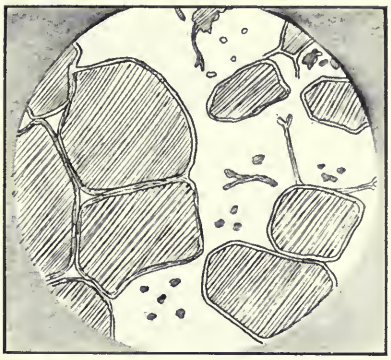


Starch of a Potato enclosed in cellulose cells highly magnified.



Starch of a Potato swelling as it absorbs water, and bursting cellulose cells.

Boiling also brings about another form of thickening. It is common knowledge that all starchy grains, such as rice, sago, tapioca, oatmeal, or macaroni, must be cooked in boiling water, otherwise they remain hard and indigestible. When well "boiled" they become soft and glutinous. The reason for this change is found in the fact that the groundwork of every part of plants, whether hard or soft, is a fibrous substance called "cellulose," a tough and indigestible material, though often of marvellous delicacy.



Starch of a Potato when changed by cooking.

If a piece of potato or a few grains of arrowroot or rice be looked at under a microscope, they will be seen to consist of numbers of little round bags (or "cells," as we call them), of which the outer covering is composed of cellulose. The nutritive starch is enclosed in these cells, and can only be released when their covering is softened by boiling. Under the influence of heat, too, the starch swells and bursts its envelope. Thus when a sauce thickens or rice softens, it means that the envelopes have burst and the contents of the cells have become soft and fit for food.

All cereals, green vegetables, and most roots must be boiled, or their cellulose framework remains tough and indigestible. Meat and poultry or fish, on the contrary, must only be boiled just long enough to seal their pores, when the cooking process must be continued at a lower temperature; for they contain considerable amounts of a substance closely resembling white of egg, called "albumen." The difference between a "lightly boiled" and a "hard-boiled" egg is familiar to us all. Fresh foods also become tough and leathery when cooked too fast or at too high a temperature.

Raw albumen is quickly and easily digestible, and so it is when heated to 134° Fahr., when fine threads of white appear in the clear, sticky liquid. If the temperature is raised another 30° the albumen becomes a tender, white jelly, when it is still quite suitable for the most delicate digestion. Eggs placed in boiling water and then stood on one side of the stove for twenty minutes, so that the water cools very gradually, are cooked to just this digestible degree. The tough condition of the "white" of a hard-boiled egg is common knowledge. It *can* be digested, but at a greater expenditure of time and energy. There are occasions when it is advantageous to be provided with hard-boiled eggs, as, for instance, when a long interval before the next meal is inevitable; but under ordinary circumstances the albumen in meat, eggs, fish, or poultry should be so cooked that its tender and digestible qualities are preserved.



Savoury Double Boiler.

WHY FOOD IS STEAMED.

This method of preparation has much to recommend it. It signifies the cooking of foods by exposing them to the vapour arising from boiling water. It is economical of space, fuel, time, food, and labour.

(1.) *Economy of Space and Fuel.*—If a steamer be used with several compartments, meat, vegetables, and pudding can all be steamed over one supply of water. The steamer occupies only a small space on the stove, or can be placed over one gas-ring or an alcohol or oil lamp.

(2.) *Economy of Time.*—The steamer, if furnished with a warning whistle, can be safely left to take care of the dinner for considerable intervals of time, during which other duties can be comfortably performed.

(3.) *Economy of Food.*—When it is thus prepared it retains not only its full flavour, but all its nutritive ingredients. It is also particularly digestible, for which reason steaming is coming into more general use.

Compare, for instance, the flavour of a marrow, tomatoes, or a cabbage when steamed in their own juices with that of similar vegetables after boiling in large quantities of water. The juices form a thin film of water in the steamer, which is converted into steam by heat. This condenses again into water as it comes into contact with the cooler vegetables within the closed

vessel; the process being again and again repeated until the contents of the steamer are cooked. Meanwhile no loss of flavour or nutritive properties is possible.

Half a pint of water suffices to steam a dozen potatoes of average size, or a large fowl or a 5-lb. joint. This is a distinct advantage where water is scarce or has to be carried some distance. A further advantage is that foods can be steamed in the fireproof or china dishes in which they are to be served. This is an economy in "washing-up."

Under the name of "double boilers" many useful varieties of steamers are now available for joints and poultry, as well as for vegetables and puddings. Perhaps the "Savoury" double boiler is among the best on the market. The advantages of cooking milk, custards, porridge, or any cereals in double boilers are too generally known to need more than passing reference.

PAPER-BAG COOKERY.

A method of steaming food, independently of utensils, has lately been given the prominence it deserves by its pioneer, Nicolas Soyer. The food is merely enclosed in a well-greased paper bag, placed on a grid or wire mat on the shelf in a hot oven, and emerges cooked to a turn, without the employment of steamer, stew-pan, or baking-dish. When cooked, the bag is torn open at the top, the contents are slipped on to a hot dish, the bag is burnt, and the washing-up of a greasy pan is saved.

(*a.*) Cooking in a frying-pan or on a griddle, with little or no fat:

Mr. Soyer points out that the success of his method depends solely on the use of average intelligence. He does not claim that all foodstuffs are suited to its use, but all kinds of meat, fish, game, and poultry, stews, curry, many egg dishes, root vegetables, and some pies and puddings, are thereby rendered appetizing and nutritious at the smallest expenditure of time, of trouble, and of money.

The Soyer bags are made of perfectly pure material; ordinary paper imparts a flavour of its own to the food. These bags are quite cheap and can be purchased in a wide range of sizes.*

Having greased the bag, the food and liquid are slipped in and the mouth of the bag is folded over and secured by a paper clip. The bag must not come in contact with a solid oven-shelf, but must be raised on a wire mat or gridiron, in order that the hot air can circulate freely all round it.

The temperature of the oven should be about 200° Fahr. The time necessary is indicated generally by Mr. Soyer in his little book on "Paper-bag Cookery." In most cases it is from ten to twenty minutes shorter than by any other method. Rashers require six minutes; about forty minutes are needed for a stew of hare, rabbit, a curry, or a fowl.

THE FIRELESS COOK-STOVE.

Of even greater convenience to the busy housewife is the method of so-called fireless cookery, the modern development of the Norwegian Hay box. It is called fireless because the food, previously heated by ordinary methods, is placed under conditions which prevent the heat from escaping.

It stands to reason, does it not, that if a ham be heated over the stove and then is immediately enclosed in such a way that no loss of heat can take

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*Particulars of where these bags may be procured with full directions for their use can be obtained from the Secretaries of the Women's Institutes.

place from the water in which it is immersed, the meat must continue to cook. The process is somewhat longer than if the pan were left on the stove, but the results are better; the meat is more tender and the flavour is first-rate. Meanwhile no attention has been required and the cost of fuel has been saved.

Experience shows that if a stew be prepared, heated for twenty minutes, and put in the fireless cooker late on Saturday, it will be steaming hot and delicious when taken out at midday on Sunday—if, be it said, the box is left unopened.

The result is a saving of Sunday work, yet the satisfaction to the family of a hot meal. Or the cooker vessel may be filled overnight with boiling water; it will be found scalding hot in the morning.

HOW TO MAKE A FIRELESS COOKER.

In its simplest form a fireless cooker consists of a pan that can contain boiling water enclosed in a wooden box, with enough insulating material between the pan and the box to prevent the heat from escaping. It can be quite easily made at home and will be found an invaluable possession.

(1.) Make a wooden box, of which the inside measurements should be at least 18 by 18 by 15 inches.

(2.) Select a pail from 9 to 12 inches in diameter and about 8 inches high, with a close-fitting lid.

(3.) Surround the pail with two or three thicknesses of cardboard, firmly bound in place with string.

(4.) Fill the bottom of the box with packing to a depth of at least 3 inches (ground cork, such as that in which grapes are packed, or sawdust are good materials to use). Place the cardboard cylinder, with the pail inside it, in the middle of the box, upon the layer of packing. Then pack more sawdust all round it level with its upper edge, pressing the packing down very firm and hard.

(5.) Cut a piece of thin wood to fit exactly the inside measurement of the box. In this cut a circular hole of just sufficient size to permit the pan to be drawn in and out through the opening. Fit this down firmly upon the packing, which it will keep in position.

(6.) Make a cushion of sawdust, 3 inches thick, to fill completely the whole surface of the box above the slab of wood, so that the pan is enclosed on all sides by the same thickness of packing. Attach a well-fitting lid to the box, with strong hinges, and fasten with a hasp. Castors are a useful addition, as they allow the box to be run under the table out of the way.

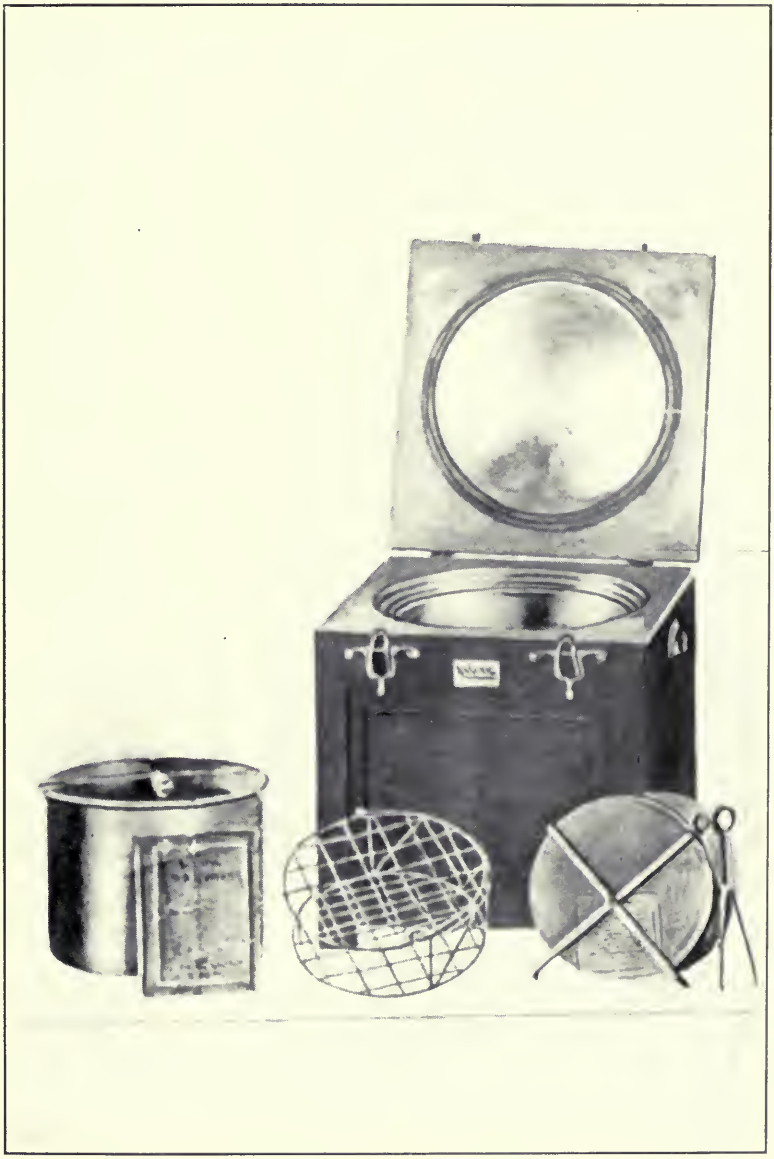
A granite pail is to be preferred. If a tin pail be used, it should be coated with clear dripping and baked before use. This will darken but not injure it, and will prevent rust.

When a stew is to be cooked, heat all the ingredients, after mixing, in an earthenware jar, until thoroughly hot. Cover, and plunge instantly into the pan in which water at boiling-point should reach two-thirds the height of the jar of stew. Cover the pan, put the cushion in place, and immediately close the box, which must not be reopened until the stew is cooked. Allow from three to four times the ordinary time; experience soon guides to the right allowance, though no harm is done if it be considerably exceeded.

In the case of a ham, fowl, or joint of meat, the preliminary heating should take place in the pan itself, which must be plunged with all speed into the box after twenty or thirty minutes on the stove. The cooking process is carried on so long as the large body of boiling water or other liquid retains its heat.

THE MODERN FIRELESS COOK-STOVE.

The modern fireless cook-stove now on the market offers superior advantages over the home-made box, in that it enables foods to be roasted and baked as well as stewed or steamed.



Fireless Cooker, with Equipment for Roasting and Baking.

The stove itself (of which there are many varieties from which to select) is substantially similar to that just described. That is to say, it is so constructed that heat once enclosed cannot escape; but, of course, it is lined with some non-absorbent metal which makes for cleanliness, and it contains from one to three compartments, so that a whole meal can be prepared by its means.

For the baking or roasting of food what are described as "radiators" are supplied, round disks of iron or steatite. The procedure for roasting is as follows: Place two of the radiators over the flame of the stove for half an hour; meanwhile wipe the joint, dust it with pepper and salt, and place it in the cooking-vessel. Transfer a sizzling-hot radiator to the bottom of one of the compartments of the cooker, then fit the rack provided into the top of the vessel, over the meat, instead of a cover; deposit the vessel in the compartment, quickly transfer the second radiator from the stove to the rack, close down the cooker, and leave it for the time necessary, according to the size of the joint, say two hours. When removed, the meat will be found brown and delicious, with sufficient gravy to strain and boil up in the usual way.

Note.—The absence of basting, yet the joint is not burnt; the economy of fuel, yet the meat is done to a turn; the saving of labour, yet the certainty of success.

Some practice is necessary to succeed equally well with baking bread or cakes; but, given the attention called for, most excellent results are obtained.

Not to be overlooked is the further advantage that, if absence be necessary for some hours, whether on business or pleasure, no ill effects result to the food. A hot, appetizing meal will await the return of the family, as well as a supply of scalding water to bathe the tired children or to wash the dishes as desired.

No home, no camp, no institution, can afford to ignore the benefit conferred by this wholly excellent addition to kitchen equipment.

FRYING.

This is a favourite method of preparing food with busy people, because it is the quickest. When food is fried in a deep pan, containing sufficient fat to cover it, the result is wholesome and attractive, but the process does not render food so digestible as it is when steamed or slowly cooked. Frying in a shallow pan with a very small amount of fat is a fruitful source of indigestion.

Fat has to be heated to a far higher temperature than boiling water before it is fit for cooking purposes. If the food is dropped into it before this high temperature is reached, it becomes sodden and dark in colour, coated, even soaked, with indigestible grease. On the other hand, during the process of reaching the necessary high temperature (indicated by the absence of all spluttering and the passing-off of a bluish vapour) the fat undergoes chemical changes which affect its digestibility, while the acrid, irritating fumes given off are distinctly objectionable.

Given a deep bath of fat at the right temperature and the immersion therein of food coated in a mixture of egg and breadcrumb, and the product is a golden brown, dry, appetizing morsel. The nutriment it contains has been retained by the rapid hardening of the albumen in the egg, which also prevents the absorption of fat.

Fat which bubbles when it contains no food is not hot enough for frying. The "spluttering" stage is brought about by the escape of the water contained

in the fat in the form of steam, consequently the temperature of the fat at that stage is only that of boiling water. The spluttering recurs on the immersion of fish, potato, etc., owing to the explosion of the bubbles of water in the food, as they expand on conversion into steam.

REASONS WHICH UNDERLIE SOME FAMILIAR COOKING PROCESSES.

The more inquiries made into the why and wherefore of cooking, the more interesting they become and the more we realize how little we know as yet on the subject.

Scientific experts in England and the United States are now devoting much time and great skill to the investigation of the "reason why" for kitchen procedure, because of its vast influence on human well-being. Few of these reasons are as yet known, but we have learned at least some.

Reasons for cooking Rice.

Rice is first washed in cold water to remove the particles of starch clinging to the grains, which would otherwise cause them to stick together when cooked, so forming a sodden mass.

The washed rice must be thrown into boiling water, in order to separate the grains, so that each may be thoroughly cooked. The water must be abundant, as starchy foods cannot soften, expand, and become digestible unless there be sufficient water for them to absorb.

Rice is drained and dried before serving, to render it more digestible and appetizing by separation of the grains.

Some Reasons for the Changes which take place in Bread-making.

These changes are of two kinds, chemical and mechanical. The "sponge," for instance, is the result of the bubbles of gas liberated by the action of the yeast upon the flour (or, rather, upon a kind of sugar in the flour).

The crisp, brown crust is caused by another chemical change in the flour, brought about by the high temperature to which the outside of the loaf is exposed.

The kneading of the dough is a mechanical process, designed to make it elastic, and to secure that the chemically formed gas-bubbles shall be broken up into small portions and evenly distributed throughout the loaf, which thus becomes "light" and porous.

The dough is then baked—

(*a.*) To kill the yeast ferment, so that its action shall not continue beyond the degree necessary to make the bread light:

(*b.*) To burst the starch-grains in the flour, so that they become digestible and nutritious:

(*c.*) To expand the bubbles of gas and make the bread porous:

(*d.*) To stiffen the gluten in the flour, so that the loaf preserves its shape:

(*e.*) To crisp the crust, so that the loaf shall be appetizing, of a good appearance, and be well chewed.

Space does not allow of any more illustrations being given to show the interesting reasons which underlie every process carried on daily in our kitchens; but enough has been said to indicate not only the responsibility of the cook, but how directly dependent are nutrition and economy upon her skill and high standard of work.



Steamer.

COOKING IS AN ART, A CRAFT, A SCIENCE, A SERVICE.

It is an *art*, because life makes numberless demands upon the human system which cooking can assist it to meet. The more civilized we become, the more unexpected and severe is the wear and tear of daily existence. The art of cooking lies in providing such a food-supply for the family that, while containing the elements essential to good nutrition, it shall be suited to the

requirements of season, work, age, and sex, and shall combine economy with due variety of flavour, and that attention to attractive service which contribute substantially to good digestion.

It is a *craft*, because a good cook exercises much manual dexterity and uses a degree of skill so familiar as to be unobserved, unless the results of its absence are resented by the stomach and deplored by its owner!

It is a *science*, because it has laws of its own, which it is our duty to discover, to learn, and to apply. When our cooks are as well trained as our doctors, the doctors will find their present occupation of ministering to "the sickest beast alive" is gone, and they will be free to devote all their attention to the prevention rather than the cure of disease. "The cook makes, the physician mends." Alas! how often the cook makes sickness, not health!

It is a *service*, often despised and left in the hands of the ignorant or the careless. Actually it is an honourable calling, controlling in a large measure the welfare of humanity.

No other art or science is so little understood, so lightly esteemed, or so casually performed. There is no craft where less progress has been made by the introduction of more intelligent utensils and tools. There is no service less considered, or of which the worth and dignity are less perceived.

The Women's Institutes must see to it that British Columbia shall be distinguished by their persevering efforts to insure that the study of the preparation of food shall in future be intelligently pursued. When the results of such study are practically applied, the nutrition of its population will redound to the credit of those in whose hands rests the necessary provision and the right preparation of its daily bread—the wives, sisters, and daughters of the nation.

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NOTICE.

The Department of Agriculture will issue the following series of bulletins prepared by Miss Alice Ravenhill, Shawnigan Lake, B.C., to be available for distribution among the members of the Women's Institutes throughout the Province:—

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2. The Preparation of Food.
3. The Preservation of Food.
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